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horizontal movement of the arbor with the disks is accomplished in this way, and the slots are cut through to the required length; the extent of horizontal travel is regulated by the stop (11). The carriage moves by the force of gravity of the weights (12), the necessary pressure during the horizontal cutting of the slots being created by a selection of the proper weights. The carriage (8) hinged with the piston of the horizontal hydraulic damper (9) is analogous in working principle and purpose to the vertical damper, but operates when the arbor with the disks moves horizontally.

Vertical and horizontal arbor travel are controlled by two pilot wheels through control ropes (13) and a pull rod (14). The arbor with the cutting disks is brought into rotation by the electric motor (15) through a V-belt and gear transmission. The disks are connected to the negative pole of the direct-current generator by a commutator and brushes, and the plate is connected to the positive pole.

A tank with waterglass solution is located beneath the machine-tool table. The electric motor (17) transmits motion to the gear pump (16) which feeds the solution through an intake hose (18) and delivery hose (19) and a nozzle (20) to the cutting area. The design of the nozzle assures an abundant and even flow of solution to all cutting disks. The waterglass solution returns by gravity to the tank through a hole in the table and a drain hose (21).

An instrument board is located alongside the machine tool. This includes a direct current ammeter and voltmeter and two signal lights of different colors. One bulb lights up on completion of the vertical cutting of the slots, at which time the vertical stop closes the electric contact; this bulb continues lit during the horizontal cutting. The other bulb lights up on completion of the horizontal cutting, with the horizontal stop closing the corresponding electric contact, and signals the completion of a given group of slots. After this, the arbor and disks are returned to their original position (the light in the bulbs goes out) and the table with the plate fastened to it is moved, bringing the plate under the disks in the proper position for cutting the next group of slots. The number of slots cut at one time is determined by the number of disks mounted on the arbor.

About 180 brass disks can be mounted on the arbor, cutting the same number of slots in one vertical and horizontal stroke.

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Ordinarily, in the preparation of a working liquid for anode-mechanical cutting, it is recommended that the waterglass be diluted with water to a specific gravity of 1.28-1.30. However, experiments have shown that liquid of this specific gravity in the present case does not provide sufficiently stable electrical operating conditions, and does not assure the necessary quality of slots being cut. Better results are attained in working with a solution having a specific gravity of 1.34-1.36. (This recommendation does not have to be extended to other cases of anode-mechanical processing.)

As a result of testing, the following specifications were determined to be the best for cutting slots by the anode-mechanical method: material of cutting disks, hard or semihard brass of Type 162; diameter of disks, 80 millimeters; diameter of interjacent washers, 56 millimeters (maximum protrusion of disks in relation to the washers, 12 millimeters); speed of arbor with disks, 2,100 revolutions per minute (the peripheral speed of the disks is 8.8 meters per second); voltage, 14-15 volts; current intensity, 1 ampere (per disk).

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With these specifications, the time for cutting 180 slots 75 millimeters long in a plate 1.5 millimeters thick, with disks 0.5 millimeters thick was 20 minutes. The width of the slots was 0.55 millimeters, which is within the specified tolerance (0.5 ± 0.05); the surface finish of the slots (determined by comparing with standards) corresponded to the fifth class according to GOST 2789-45, which is adequate. The diameter of the disks decreased 0.2 millimeters as a result of wear after each cut. Thus, 8-10 plates can be machined with one set of 180 disks.

A total of 1,098 slots (six rows with 183 slots in each), 0.5 millimeters wide, 47 millimeters long, in checkered arrangement, were cut in 620 x 378 x 1.5 millimeter plates made of 1Kh18N9T stainless steel.

The manufacture of drums for knotters from stainless steel with the use of the anode-mechanical method of cutting slots will have the following technical and economical effect: more than 13 tons of brass will be saved a year; the weight of the drums will be decreased about three times; labor productivity will increase 2.7-3 times as compared with the mechanical method of cutting slots in brass plates, and 15-25 times as compared with similar machining of stainless steel (using mills made of high-speed steel). As a result, the cost of each drum will decrease at least 10 percent.

Multidisk anode-mechanical machine tools can find application not only in the manufacture of paper-making equipment but in other branches of machine building; for example, for cutting blanks for rings of antifriction bearings.

Appended figures follow:

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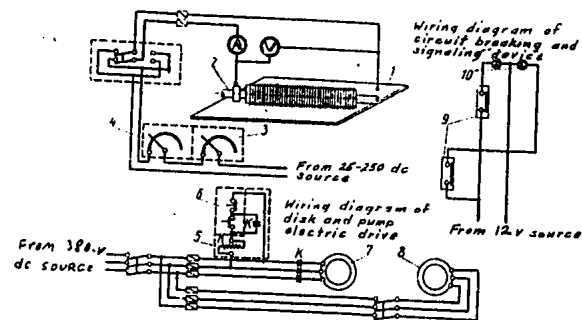


Figure 1.

1. Plate being processed
2. Arbor with disks
3. Rheostat
4. Potentiometer
5. Magnetic starter
6. Push button station
7. Electric motor for disks
8. Electric motor for pump
9. Terminal circuit breakers
10. Signal lights

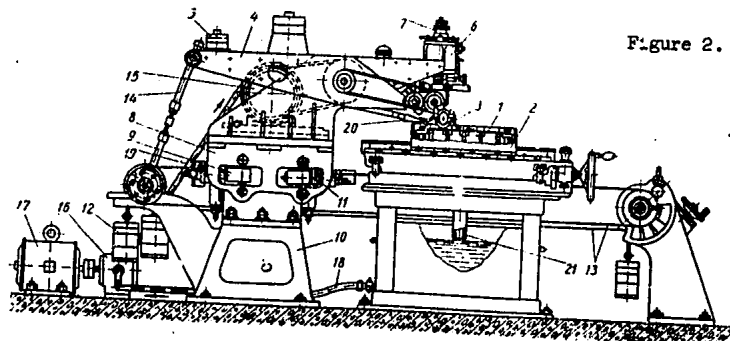


Figure 2.

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